

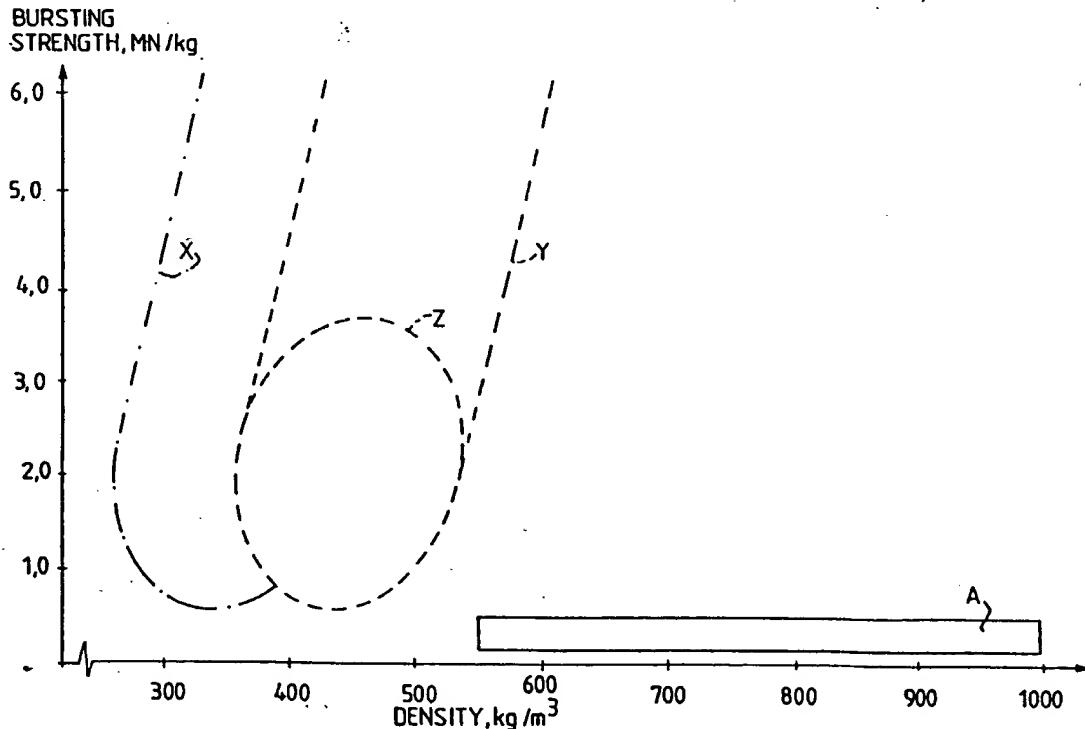
**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(72) Inventors; and	Published
(75) Inventors/Applicants (for US only): ERIKSSON, Lennart [SE/SE]; Klackvägen 37, S-852 54 Sundsvall (SE). KOLAR, Milan [SE/SE]; Vikingavägen 73 B, S-852 46 Sundsvall (SE). HÄGGLUND, Tjell-Åke [SE/SE]; Ängsvägen 32, S-860 35 Söråker (SE). HÖGLUND, Hans [SE/SE]; Öhn 1060, S-864 00 Matfors (SE).	With international search report.

## (54) Title: EASILY DEFIBERED WEB-SHAPED PAPER PRODUCT



The invention relates to a product easy to disintegrate, containing cellulose-containing fibre material, which has such a strength, that it can be reeled up or handled in sheet shape for storage and transport, without the addition of chemicals, which increase the bonding strength between the fibres. The product is characterized in that it has a density of 550-1000 kg/m<sup>3</sup>, a bursting strength of 0.15-0.50 MN/kg and a grammage of 300-1500 g/m<sup>2</sup>, and that the product has a dry solids content of 70-95%.

**EASILY DEFIBERED WEB-SHAPED PAPER PRODUCT**

This invention relates to a paper product of the kind being dry-defibered and converted to fluffed state for manufacturing therecf, for example, sanitary articl-es, such as napkins and sanitary towels.

5 Materials of this kind have been used since long for the manufacture of products of the kind in question and are produced and marketed in the form of sheets or rolls. As fibre material sulphite or sulphate pulp and also chemimechanical pulp, so-called CTMP, are used.

10 These products conventionally are produced in the wet way in that a fibre suspension is dewatered on a wire, pressed and dried. The dried wet is reeled up or cut to sheets. As starting material sulphate or sulphite pulp or chemi-mechanical pulp (CTMP) are used. The pulps made in this 15 way are sold as so-called roll or sheet pulp.

The pulps alternatively can be sold in web shape after flash drying of the fibres. At flash drying the pulp fibres are dried in a fan drier. A pulp web is hereby pressed to about 50% dry solids content and torn so that individ-20 ual fibres or fibre flocks are detached and thereafter dried when passing through the piping of the fan drier.

25 The flash dried pulp then is pressed to bales. The result-ing product has high density, which offers transport-tech-nical advantages compared with reel or sheet pulp.

30 The transport economy of reel pulp, moreover, is made worse by the fact that cylindric rolls have a low packing degree.

The chain of manufacture for soft absorption materials, such as napkins and towels, starts with the dry defibering or tearing of sheet, reel or bale pulp in order to detach the individual fibres bound in the sheet, web or bale. Due to their low moisture content, the pulp fibres then are relatively brittle. When there is a high bonding

strength between the fibres in sheet, reel or bale pulp, the risk is great that the fibres will be damaged at the dry tearing and that much undesirable so-called fine material or dust will be formed. This is due to the fact, 5 that a high bonding strength between the fibres implies high defibering energy. The producers of reel and flash dried pulp, therefore, are required to try to produce a product as easily to be torn as possible, with weak fibre bonds in the product, which, however, must meet certain 10 strength requirements for having good runnability in the defibering equipment. In order to obtain a product easy to tear, the roll or sheet manufacturer in the commercial processes of to-day must increase the bulk of the product, which then also deteriorates its trans- 15 port economy.

These problems are solved by the present invention.

The invention, thus, relates to a product'easy to defiber which substantially contains lignocellulose-containing fibre material, which at defibering easily can be converted 20 to fluffed state for being used at the manufacture, for example, of products for sanitary purposes, such as napkins and towels, and filters, which web-shaped product has such a strength that it can be reeled up or handled in sheet shape for storing and transport, without the 25 addition of chemicals increasing the bonding strength between the fibres.

According to the invention, the product has a density of 550-1000 kg/m<sup>3</sup>, preferably 550-700 kg/m<sup>3</sup>, a bursting strength of 0.15-0.50 MN/kg, preferably 0.20-0.40 MN/kg 30 and a grammage of 300-1500 g/m<sup>2</sup>, preferably 500-1000 g/m<sup>2</sup>, the product having a dry solids content of 70-95%.

The values are determined according to the following standards issued by the Scandinavian Pulp, Paper and Board, Testing Committee.

<u>Density</u>	570 kg/m <sup>3</sup>
<u>Bursting strength</u>	0.24 MN/kg
<u>Dry solids content</u>	83%

In the accompanying diagram the properties of several  
 5 pulps as regards the bursting index and density are  
 shown. The area for chemi-mechanical pulp (CTMP) wet-  
 -formed in conventional manner is designated by X, and  
 for wet-formed sulphate pulp by Y. Within the latter area  
 an area has been designated by Z. This area refers to  
 10 wet-formed sulphate pulp, to which so-called debonds  
 have been added.

The product according to the invention lies in the area

A and differs apparently essentially from previously  
 known products.

15 The reel pulp manufactured according to the above example  
 from CTMP-pulp was then used for making napkins in a  
 test machine.

The reel pulp was dry defibered in a so-called hammer  
 mill, which is comprised in the standard equipment for  
 20 dry defibering of pulp webs at fluff pulp defibering.

As reference at the tests two commercial reel pulps  
 were used which had been wet-formed according to conven-  
 tional technique, viz. a CTMP-pulp and a sulphate pulp.  
 The pulps had the properties as follows:

	CTMP	Sulphate
25 Density, kg/m <sup>3</sup>	340	450
Bursting strength, MN/kg	1.0	1.5
Dry solids content, %	90	90

At tests carried out on the defibered pulps included as  
 raw material, the following values were obtained:

Claims

1. Easily defibred web-shaped product containing substantially lignocellulose-containing fibre material, which at defibering easily can be converted to fluffed state containing a high proportion of free fibres for being used at the manufacture, for example, of products for sanitary purposes, such as napkins and towels, and filters, which web-shaped product has such a strength, that it can be reeled up or handled in sheet shape for storing and transport, without the addition of chemicals increasing the bonding strength between the fibres, characterized in that it has a density of 550-1000 kg/m<sup>3</sup>, preferably 550-700 kg/m<sup>3</sup>, a bursting strength of 0.15-0.50 MN/kg, preferably 0.20-0.40 MN/kg and a grammage of 300-1500 g/m<sup>2</sup>, preferably 500-1000 g/m<sup>2</sup>, and that the product has a dry solids content of 70-95%.
2. A product as defined in claim 1, characterized in that it contains thermo fibres and/or super-absorbing polymers.
3. A product as defined in claim 1, characterized in that the lignocellulose-containing material is a high-yield pulp, i.e. a pulp made in a yield exceeding 90%.
4. A product as defined in claim 3, characterized in that the lignocellulose-containing fibres have a curl value of 0.20-0.40.

# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 89/00605

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) \*

According to International Patent Classification (IPC) or to both National Classification and IPC  
IPC5: D 21 H 11/00, D 21 C 9/00, D 04 H 1/00

## II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC5	D 21 C; D 21 F; D 21 H; D 21 G; D 04 H

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched \*

SE,DK,FI,NO classes as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT\*

Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. 13
A	EP, A1, 0184603 (KORSNÄS-MARMA AB) 18 June 1986, see page 1, line 1 - line 26 --	
A	EP, A1, 0132128 (THE PROCTER & GAMBLE CO) 23 January 1985, see the whole document --	
A	US, A, 4432833 (BREESE) 21 February 1984, see the whole document --	
A	US, A, 4303471 (LAURSEN) 1 December 1981, see the whole document --	

\* Special categories of cited documents: 10

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search  
22nd January 1990

Data of Mailing of this International Search Report

1990-01-20

International Searching Authority

SWEDISH PATENT OFFICE

Signature of Authorized Officer

Åke T Larsson *Åke T Larsson*

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO. PCT/SE 89/00605**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP-A1- 0184603	18/06/86	NONE		
EP-A1- 0132128	23/01/85	CA-A- DE-A-	1230708 3468050	29/12/87 21/01/88
US-A- 4432833	21/02/84	JP-A- DE-A- AU-D- SE-A- CA-A- AU-A-	57056600 3119907 70816/81 8103078 1152710 537472	05/04/82 01/04/82 26/11/81 20/11/81 30/08/83 28/06/84
US-A- 4303471	01/12/81	FR-A-B- DE-A-C- CA-A- SE-A-C- SE-A-	2431569 2929512 1129604 425512 7808056	15/02/80 31/01/80 17/08/82 04/10/82 23/01/80
US-A- 3930933	06/01/76	NL-A- LU-A- FR-A- DE-A- GB-A- CH-A- CA-A- AT-A- BE-A-	7105437 62818 2115773 2110900 1348409 555942 947915 303510 764430	29/05/72 08/11/71 07/07/72 31/05/72 20/03/74 15/11/74 28/05/74 15/10/72 17/09/71
US-A- 3617439	02/11/71	NL-A- DE-A-B,C FR-A- GB-A- SE-A-	6919620 2000028 2027674 1300236 366788	06/07/70 16/07/70 02/10/70 20/12/72 06/05/74